



**Semester I Examinations 2013/ 2014**

<b>Exam Code(s)</b>	4BCT
<b>Exam(s)</b>	B.Sc. in Computer Science and Information Technology
<b>Module Code(s)</b>	CT417
<b>Module(s)</b>	Software Engineering III
Paper No.	1
Repeat Paper	
External Examiner(s)	Prof. Liam Maguire
Internal Examiner(s)	Prof. G. Lyons Dr. Michael Madden Dr. David O'Sullivan * Dr. Owen Molloy *

**Instructions:**

Candidates must attempt six questions from Section A (Dr. O'Sullivan), and five questions from Section B (Dr. Molloy).

***Use separate answer books for each Section.***

**Duration**

2 hours

**No. of Pages**

5

**Requirements:**

MCQ

Handout

Statistical/ Log Tables

Cambridge Tables

Graph Paper

Log Graph Paper

Other Materials

Release to Library:

Yes

☐

No

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## **SECTION A**

**(Project Management – Dr. O’Sullivan)**

Attempt 6 questions only (30 minutes).

All questions carry equal marks.

Make reference in your answers to personal experience, case studies and other reading.

1. Give one example of each of the following types of innovation: product, process and service. **[5]**
2. Outline the process of defining goals for an organisation. **[5]**
3. Explain the key techniques used for analysing the environment of an organisation (e.g. PEST). **[5]**
4. How do strategic objectives differ from performance indicators and also projects? **[5]**
5. List seven indicators that might be considered by the management team in a university. **[5]**
6. What is creativity and how does it differ from innovation? **[5]**
7. Outline the key stages of a project lifecycle. **[5]**
8. Explain the ‘portfolio dominates’ approach to balancing a portfolio of projects. **[5]**
9. Leaders are sometimes accused of innovation myopia. Explain. **[5]**
10. Explain the process used by IDEO when they attempted to redesign the shopping trolley for a supermarket? **[5]**

## **SECTION B**

**(Software Quality – Dr. Molloy)**

Attempt any 5 questions only (90 minutes).

All questions carry equal marks.

1. Different stakeholders in a project have different perspectives on software quality.
  - i. Describe three main stakeholders in the development of an online hotel booking system.
  - ii. Using a quality model (e.g. McCall's quality factors), define the quality characteristics which the three stakeholders would require for the system.
  - iii. Discuss the possible metrics you might use to measure those quality characteristics.

**[14]**

2. For any 5 of the following metrics, (a) explain how it is measured, and (b) explain what it indicates regarding the quality of the system (e.g. maintainability).
  - i. Comment Percentage
  - ii. Fan-In
  - iii. Cyclomatic Complexity
  - iv. Depth of Inheritance Tree
  - v. Weighted Methods Per Class
  - vi. Number Of Children
  - vii. Response For Class
  - viii. Lack of Cohesion of Methods

**[14]**

3. You have been asked to initiate a Process Improvement project to improve productivity in a development team. Describe:
  - i. The main phases of the project.
  - ii. The activities you would envisage as part of the project.
  - iii. How you would involve team members in the improvement project.
  - iv. The tools you would use in each phase of the project.

**[14]**

4. For each of the following types of waste in software development, give (a) an example of this type of waste, and (b) explain why it is considered undesirable.

- i. Partially done work.
- ii. Extra (unnecessary) Processing.
- iii. Overproduction / Extra Features.
- iv. Delays / Waiting.
- v. Task Switching.

**[14]**

5. You are developing a new mobile app for a college sports club. You are unsure of which type of app (Apple, Android, mobile) to develop, and which features to focus your efforts on. Describe how the Kano analysis method can be used to prioritise such requirements, and explain the procedure you would use to apply it.

**[14]**

6. Explain the meaning of the following terms pertaining to the Scrum agile process:

- Sprint
- Product Backlog
- Sprint Backlog
- Daily Scrum
- Burndown Charts
- Sprint Retrospective

**[14]**

7. You are part of a large software maintenance team. While you are dealing with a variable quantity of bug fixes from today, you must also deal with occasional priority bugs which have to be pushed through the main process steps (diagnose, fix, test and release) as quickly as possible. Your boss has asked you to look at introducing Kanban to help manage the process. Describe, using appropriate diagrams, how the process might work, and what the advantages might be.

**[14]**

8. A software development team has asked you to help. They are experiencing a very high level of variability in customer satisfaction with the quality of your software. Describe (using examples) how the following tools could be used in your analysis of the problem.

- Fishbone Diagram
- Pareto Chart
- Histogram
- Scatter Chart
- Control Chart

**[14]**